R E M A R K S

Re-examination and reconsideration are hereby requested.

Before discussing the claims and how they distinguish over the cited art, perhaps it might be helpful to review features of applicant's invention.

Referring to FIGS. 2 and 4, it is noted that with applicant's invention, the fuel control system 10 includes a controller 20 that produces a modified pedal position fuel demand signal indicated in FIG. 3 by numerical designation 21. The modified pedal fuel demand signal is equal to the unmodified pedal fuel demand signal produced by accelerator pedal fuel demand signal generator 14 (FIG. 2) *increased by a bias value.* Under certain conditions to be described in more detail below, *the bias value is a predetermined offset, or hysteresis value, from the base fuel demand signal.* Thus, the modified fuel control signal is indicated in FIG. 3 by the numerical designation 21.

More particularly, the bias is initialized to zero. *When the pedal position exceeds a predetermined, relatively small, say .05 degrees, pedal position tip-in constant, the bias is a function of the idle speed fuel controller 12 fuel signal minus a fixed, predetermined hysteresis value.* Thus, a subtractor 22 forms the bias value equal to the base fuel demand produced by idle speed fuel controller 12 minus the idle fuel hysteresis value, as shown, in FIGS. 2 and 3.

The controller 20 provides an actual fuel control signal for the engine 11. *The actual fuel signal is equal to the greater of the base fuel demand signal 13 (FIG. 3) and the modified pedal fuel demand signal 21 (FIG. 3).* Thus, in FIG. 3, prior to time T1 the engine is in an idle condition and the pedal is the zero degree position. The pedal is depressed beginning at time T1 and here, for example, increases somewhat linearly. *It is noted that the amount a fuel actually supplied to the engine will be the greater of: (1) the required idle fuel supplied by the idle speed fuel controller 12 (i.e., curve 13); and (2) the modified pedal position demanded fuel (i.e., curve 21).* Thus, it is noted that until the pedal position demanded fuel exceeds the required idle fuel supplied by the idle speed fuel controller 12, here at time T2, the fuel actually supplied to the engine is that from the idle speed fuel controller 12. Thus, with the added bias to the unmodified pedal position signal 15, the dead

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pedal "delay" (i.e., DEAD PEDAL "NEW") is reduced from DEAD PEDAL "OLD" and the "performance-feel" of the vehicle to the operator is improved.

More particularly, the system 10 includes a comparator 24 fed by the idle speed fuel controller 12 and the modified pedal position fuel signal to produce a control signal for switch 26. The switch 26, in response to the control signal selects whether the idle speed fuel controller 12 fuel signal or the modified fuel signal is supplied as the fuel deliver signal for the engine 11. As noted above the amount a fuel actually supplied to the engine 11 will be the greater of: (1) the required idle fuel supplied by the idle speed fuel controller 12 (i.e., curve 13); and (2) the modified pedal position demanded fuel (i.e., curve 21), FIG. 3. Referring to FIG. 3 it is noted that the system reduces the amount of dead pedal time delay.

Referring now to FIG. 4, a flow diagram is shown of the overall method used to provide the fuel delivered to the engine by the system of FIG. 2. The process is initialized when the engine starts. This is referred to as State 0 and bias fuel is set to 0, Step 402. Next, in Step 404, the modified pedal position fuel is calculated as being equal to the pedal position fuel plus the bias fuel. In Step 406 the modified pedal position fuel is used as the actual fuel signal for the engine 11. In Step 408, a determination is made as to whether the base fuel demand from the idle speed fuel controller 12 is less than the calculated modified pedal position fuel. If YES, the process returns to Step 402. This condition is referred to as GOV_CL=0. Otherwise, the process proceeds to Step 410, which is referred to as GOV_CL=1. In Step 410, the process enters state 2 and the bias fuel is calculated as being equal to the idle fuel minus a factory-calibrated constant, referred to as idle fuel hysteresis. In Step 412, the modified pedal position fuel is calculated as being equal to the pedal position fuel plus the bias fuel calculated in state 2. In Step 413, the process uses the base fuel demand from the idle speed fuel controller 12 as the actual fuel signal for the engine 11. In Step 414 a determination is made as to whether the pedal position is greater than a calibrated constant referred to as pedal position tip-in stored within the pedal state machine 20 (FIG. 2). If it is not, the process returns to Step 410; otherwise, the process proceeds to Step 416 and enters state 1. Here, the bias fuel calculated in Step 410 is maintained (or "frozen"). Next, in Step 418, a calculation is made of modified pedal position fuel as being equal to pedal position fuel plus the frozen bias fuel calculated in Step 416. In Step 420, a determination is

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made as to whether the base fuel demand from the idle speed fuel controller 12 is less than the modified pedal position fuel. If is not, the process returns to Step 412 (i.e., indicated as GOV_CL=1); otherwise, the process proceeds to Step 422 (indicated as GOV_CL=0). Next, if still in state 1, a determination is made as to whether the pedal; position is less than the factory calibrated pedal position tip-out constant stored in the state machine 20 (FIG. 2), Step 424. If it is, the process returns to Step 402 (i.e., State 0); otherwise, the process returns to Step 416, State 1, where the bias fuel is maintained, or frozen.

Claims 1, 3 and 5 stand rejected as being anticipated by Graves (US 5,445,126). Claim 1 points out that the fuel control system includes a controller for producing a modified fuel demand signal based on an unmodified fuel demand signal *and a bias value, said bias value* being a predetermined *offset* from *a base fuel demand signal, said base fuel demand signal being sufficient to maintain the engine in an idle condition*.

Claim 3 points out that the fuel control system includes a controller for producing a modified pedal position fuel demand signal substantially equal to an unmodified pedal fuel demand signal *increased by a bias value, said bias value being a predetermined offset from the base fuel demand signal*, said base fuel demand signal enabling idle operation of said engine.

Claim 5 points out that the method includes: providing a first fuel demand signal from an idle speed fuel controller; providing a second fuel demand signal from a pedal position signal generator; producing a third fuel demand signal being substantially equal to the second fuel demand signal *increased by a bias value*, the bias value being a predetermined offset from the first fuel demand signal; and, delivering an actual fuel amount to said engine based on a greater of said first fuel demand signal and said third fuel demand signal.

Claim 6 points out that the article of manufacture, includes:code for receiving a first fuel demand signal from a pedal position signal generator; code for generating a second fuel demand signal for obtaining an engine idle condition; *code for producing a third fuel demand signal being substantially equal to the first fuel demand signal increased by a bias value, the bias value being a predetermined offset from the second fuel demand signal;* and, code for delivering an actual fuel amount to said engine based on a greater of said second fuel demand signal and said third fuel demand signal.

As noted above, claims 1, 3 and 5 stand rejected as being anticipated by Graves (US 5,445,126). The Examiner points to column 4, lines 54 through column 5 line 33 and column 7 lines 10-55, copied below for convenience:

<u>Column 4, lines 54 through column 5 line 3</u>

As accelerator pedal 26 is further depressed, the voltage across terminals C and D increases and approaches the value of voltage applied across terminals B and C. The analog voltage signal is converted to a digital value by interface 20, which may include various A/D converters, D/A converters, signal conditioners, and the like. ECU 10 may utilize the information derived from APS 28 to determine the throttle progression for controlling engine 22 and/or transmission 24, depending on the particular mode of operation. As is known by one of ordinary skill in the art, the SAE J1939 protocol specifies various operating modes for fuel control. The present invention is compatible with, yet independent of, the SAE J1939 protocol. If utilized with the SAE J1939 protocol, the throttle progression set by the present invention controls fueling while in a throttle tracking mode. During other operating modes, such as torque control, speed control, and torque and speed limiting, engine fueling may be independent of the accelerator pedal position. The throttle progression determines the amount of fuel delivered to engine 22 based on the position of accelerator pedal 26, i.e. the engine fueling response to the range of travel of the accelerator pedal.

Referring now to FIG. 2, a diagram is shown which illustrates various parameter values utilized by the system and method of the present invention. Variables and parameters which have somewhat dynamic values and which change during operation of the system are indicated by an "x" on the scale. Other parameters are predetermined and remain fixed during normal operation of the system. Typical operating ranges are indicated with braces.

The following description of the system operation describes the role of each parameter, variable, and range illustrated in FIG. 2. An Initial Full Range value between 120% and 150% of the Normal Operating Range is set when the vehicle is started. The Current Full Throttle parameter is set to the Initial Full Range value. This alters the normal fueling progression by reducing the fueling response to a particular range of travel of accelerator pedal 26 (represented by Current THL Demand) as explained in greater detail below. This induces the operator to fully depress the accelerator pedal to a positive stop corresponding to full throttle. Once the accelerator pedal has been fully depressed, and the sensor signal is within the Hi Cal calibration range, a new value for Current Full Throttle (100% THL) is set, as described below.

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Column 7 lines 10-55,

1. A calibration for use with a vehicle equipped with said throttle controlled engine and an electronic control unit having a processor for executing a predetermined set of instructions stored in a memory so as to control the engine, the vehicle also including in electronic accelerator pedal in communication with the processor for providing a signal indicative of a requested fueling level for the engine, the accelerator pedal having a range of travel between a fully released position and a fully depressed position, a method for automatically calibrating the electronic accelerator pedal comprising:

associating a first parameter stored in the memory with a value representing the signal provided by the electronic accelerator pedal when power is first applied to the system and the signal is within a first predetermined calibration range;

altering engine fueling progression to provide a decreased engine fueling response to the range of travel of the electronic accelerator pedal so as to induce displacement of the electronic accelerator pedal to the fully depressed position; and

associating a second parameter stored in the memory with a value representing the signal provided by the electronic accelerator pedal when the signal is within a second predetermined calibration range so as to automatically calibrate the electronic accelerator pedal.

2. The method of claim 1 further comprising storing a new value in the memory for the first parameter representing the signal provided by the electronic accelerator pedal when the signal value is within the first predetermined calibration range and the signal value is less than the previously stored value for the first parameter.

3. The method of claim 1 further comprising storing a new value in the memory for the second parameter representing the signal provided by the electronic accelerator pedal when the signal value is within the second predetermined calibration range and the signal value exceeds the previously stored value for the second parameter.

4. The method of claim 1 further comprising initiating a fault handling sequence when the signal provided by the electronic accelerator pedal has a value which exceeds the highest value of the second predetermined range, the sequence including effecting an idle engine fueling level and storing a fault in the memory.

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With reference to the above, applicant finds no description of:

A fuel control system having a controller for producing a modified fuel demand signal based on an unmodified fuel demand signal *and a bias value, said bias value* being a predetermined *offset* from *a base fuel demand signal, said base fuel demand signal being sufficient to maintain the engine in an idle condition, as in claim 1;*

A fuel control system having a controller for producing a modified pedal position fuel demand signal substantially equal to an unmodified pedal fuel demand signal *increased by a bias value, said bias value being a predetermined offset from the base fuel demand signal,* said base fuel demand signal enabling idle operation of said engine, as in claim 3,

A method wherein a third fuel demand signal is provided substantially equal to the second fuel demand signal *increased by a bias value,* the bias value being a predetermined offset from the first fuel demand signal; and, delivering an actual fuel amount to said engine based on a greater of said first fuel demand signal and said third fuel demand signal as in claim 5.
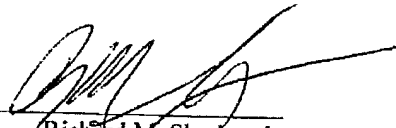
Claim 6 points out that the article of manufacture, includes: code for receiving a first fuel demand signal from a pedal position signal generator; code for generating a second fuel demand signal for obtaining an engine idle condition; *code for producing a third fuel demand signal being substantially equal to the first fuel demand signal increased by a bias value, the bias value being a predetermined offset from the second fuel demand signal;* and, code for delivering an actual fuel amount to said engine based on a greater of said second fuel demand signal and said third fuel demand signal. It is respectfully submitted that the description from Graves above does not describe *producing a third fuel demand signal being substantially equal to the first fuel demand signal increased by a bias value, the bias value being a predetermined offset from the second fuel demand signal:*

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

Respectfully submitted,

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